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14.40 Applications of hybrid-CMOS High-Speed X-ray Framing Cameras on the Z Facility

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We have begun using a new generation of high-speed hybrid-CMOS solid-state X-ray framing camera in diagnostics on the Z Facility. Initial applications are in x-ray imaging, spectroscopy, and backlighting. This new camera technology is compact and potentially much simpler to field and operate than traditional microchannel-plate or streak-camera based x-ray imagers. These advantages should make it possible to significantly increase the number of time-resolving diagnostics on Z. A custom electronics system has been developed to operate reliably in the high EMI and radiation environments produced on Z experiments and to survive fielding at a distance as close as 1m from the z-pinch load. We have also developed a compact vacuum interface that enables the sensor to be easily connected to standard vacuum systems for soft x-ray measurement applications. We will describe the performance characteristics of the camera system, the physical dimensions and vacuum interface, computer control and I/O cabling requirements, approaches used to harden the electronics, and initial measurements from experiments on Z. Sandia is a multimission laboratory managed and operated by NTESS LLC, a wholly owned subsidiary of Honeywell Int., Inc., for the U.S. DOE's NNSA under contract DE-NA0003525.

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